Closing in on Closure

T Plant completes treating K Basins sludge

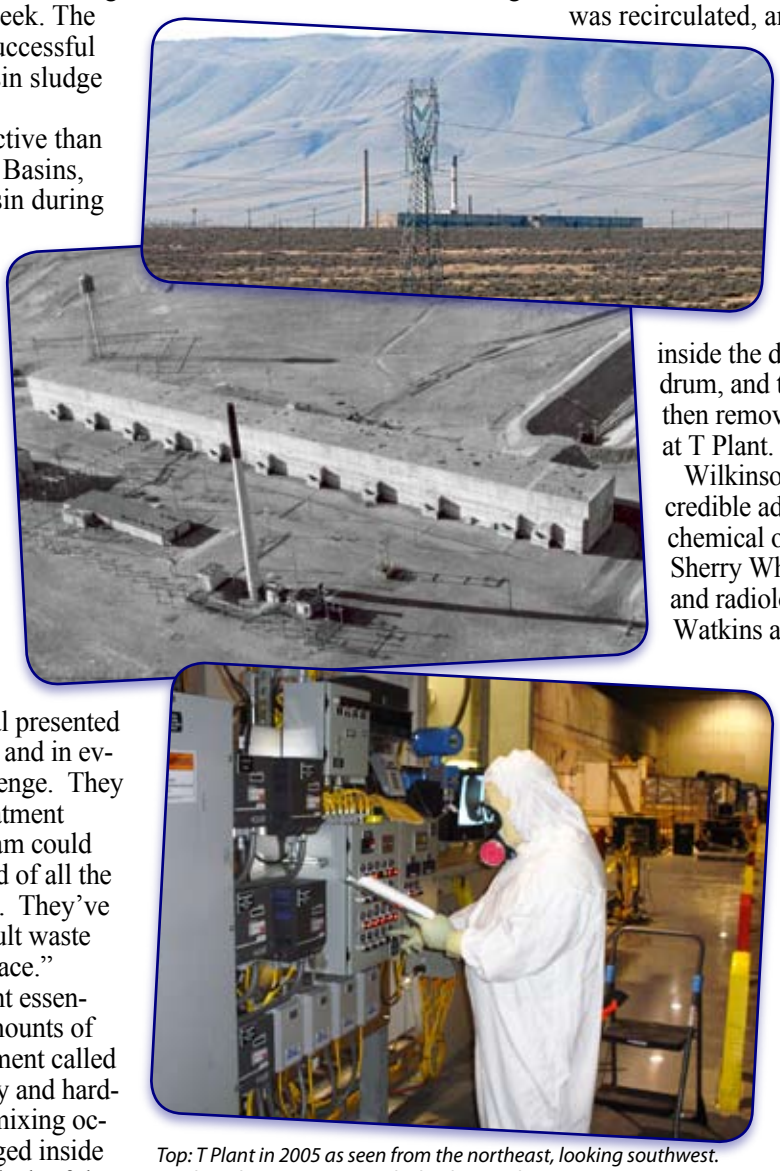
A special batch of sludge from the K East Basin's North Loadout Pit (NLOP) is now in hardened, stable form in 332 drums at T Plant, awaiting disposal. Waste Storage and Disposition (WSD) Project personnel at T Plant finished treating the three and one-half cubic meters of sludge this past week. The achievement represents the first successful retrieval and treatment of fuel-basin sludge in Hanford's 63-year history.

This sludge, slightly less radioactive than much of the other sludge in the K Basins, was removed from the K East Basin during 2004-2005. It was transported to T Plant and stored in four large diameter containers (LDCs) in a below-grade cell near the center of the facility. Treatment began near the end of October last year, and lasted just over seven months.

According to Dale McKenney, vice president for Fluor Hanford's WSD Project, "The team at T Plant was well prepared when it began. The operators and others on the team truly mastered the operating systems and then continued to perform well. The inconsistent nature of the sludge material presented challenges throughout the process, and in every case, the team rose to the challenge. They showed ingenuity and kept the treatment going. I had confidence that the team could do the job, and now I'm very proud of all the members and of their achievement. They've reduced the risk from a very difficult waste form, and made Hanford a safer place."

Treatment of the sludge at T Plant essentially consisted of mixing small amounts of the liquid sludge with a special cement called grout, and allowing the grout to dry and harden, immobilizing the sludge. The mixing occurred inside 55-gallon drums, staged inside a shielded station installed on the deck of the T Plant canyon. All steps of the transloading, mixing and drying processes were conducted under controlled conditions to minimize radiation dose to workers and assure that only small, measured amounts of sludge were moved and handled at any given time.

"The nature of the sludge itself presented the biggest difficulties," said Bob Wilkinson, T Plant manager. It turns out that the consistency of the sludge in each LDC was quite different. It varied from flighty and light, to the consistency of thick pudding. There was also a hard residue at the bottom of at least one LDC. Yet, we had to carefully control the amount of sludge and radioactivity that went into each drum."



Top: T Plant in 2005 as seen from the northeast, looking southwest. Rattlesnake Mountain is in the background.

Middle: T Plant as it appeared in 1944, brand new.

Bottom: Nuclear Chemical Operator Art Zavala operates valves at the grout-mixing station in T Plant, during sludge-treatment activities.

In the treatment process, each LDC was placed into an overpack next to a batch tank and mixing station. Then, operators carefully pumped a small amount of sludge from the LDC into a drum inside the mixing station. Radiation readings were taken as the sludge was recirculated, and a metered amount of material was transferred to each drum to ensure specified radiation levels were reached. Also, a precise amount of grout was added to each batch so that the final drum contents were kept within specifications qualifying it as contact-handled waste (i.e., below 200 millirem per hour on contact).

The mixture was then stirred inside the drum, a lid was put on top of the drum, and the mixture was left to dry and then removed to an interim storage location at T Plant.

Wilkinson is most impressed at the "incredible adaptability" displayed by nuclear chemical operators (NCOs) Ben Hovely, Sherry White, Art Zavala, David Williamson and radiological control technicians Mark Watkins and Jason King, along with supervisors Wayne Moore, Ray Bodeau and John Dent.

"The sludge threw many surprises at us, but the crew responded with innovations, flexibility and speed," says Wilkinson. They developed a "sluice mining" technique by adapting a piece of polyvinyl chloride (PVC) pipe into a spray wand that sprayed water on thick sludge that was stuck.

"The team also responded quickly and well to systems failures," he says. For example, a pump failed on a Tuesday during the pumping of LDC #2, spreading some contamination within a buffer tank enclosure. By Friday, the T Plant crew had completed the work packages, the repair work and the decontamination activities, and was once again treating sludge.

The work was also accomplished with an excellent safety record. According to Steve Metzger, treatment operations manager at T Plant, the high-risk activity was completed without any skin contaminations or recordable injuries.

The sludge-treatment achievement was hailed by Pete Knollmeyer, Fluor Hanford vice president for the K Basins Closure Project, as "a beneficial step in Site cleanup for all of us. The

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WSD Project showed professionalism, dedication, and great teaming ability in accomplishing this important work."

In the future, the drums of treated NLOP sludge will be assayed at Fluor Hanford's Waste Receiving and Processing Facility, and then stored at the Central Waste Complex in the 200 West Area to await final disposition.

The remainder of the K Basins sludge is being retrieved into underwater containers in the basins, and will be consolidated in the K West Basin in the autumn. Treatment plans for this sludge are now being developed.

Michele Gerber, Communications

Fluor Hanford project manager Mike Minette points to a standard waste box similar to those that were used to haul away equipment and material removed from the 232-Z Incinerator Building at the Plutonium Finishing Plant, shown center rear in photo. Demolition of the Incinerator Building began over the weekend.